Amended text after IPEA-report, to be used as base for national filing

Claims

1. A flexible, tubular metal device e.g. a bellows with an internal diameter up to 60 millimeters, said device comprising one or more corrugated convolutions (2), said convolutions having an overall bell-like shape with rounded top portions (T) and rounded bottom portions (B,B'), where the curvature of the outside surface of the convolutions (2) is numerically smaller at the top portions (T) than at the bottom portions (B,B'), said curvature being derived from a curve (6) defined as the intersection of the outside surface (4) of the device and a plane through the longitudinal axis (8) of the device, and where the curvature of said curve changes sign only once at a change position (P,P') located between a top portion (T) and an adjacent bottom portion (B,B''), and where the length of a first section (7) on the curve (6) is at least 10% longer than the length of a second section (9) on the curve, said first section (7) extending from one change position (P) to an adjacent change position (P') via a top portion (T), and said second section (9) extending from one change position (P) to an adjacent change position (P') via a bottom portion (B,B'), characterised in that said convolutions are placed perpendicular to a longitudinal axis (8) of the device and that the curve (6) in said first and second sections (7,9) is continuous and has non-constant curvature.

2. A device according to claim 1, characterised in that the length of a first section (7) on the curve (6) is at least 50% longer than the length of a second section (9) on the curve, said first section (7) extending from one change position (P) to an adjacent change position (P') via a top portion (T), and said second section (9) extending from one change position (P) to an adjacent change position (P') via a bottom portion (B,B').

3. A device according to claim 1 or 2, characterised in that the curvature of the convolutions is numerically at least 20% smaller by the top portions (T) than by the bottom portions (B,B').

4. A device according to one or more of claims 1-3, characterised in that the pitch-height ratio (q) is between 0.7 and 1.0.

5. A device according to one or more of claims 1-4, characterised in that the curve (6) between a bottom (B,B') and an adjacent bottom section (B',B) has one global maximum placed at the top portion (T) and two global minima, said minima being placed by the bottom portions (B,B'), and in that the curvature by the global maximum of the curve (6) has a local minimum.

6. A device according to one or more of claims 1-5, characterised in that curvature of the curve (6), between a top portion (T) and an adjacent bottom section (B',B), has a local minimum.

7. A device according to one or more of claims 1-6, characterised in that a section of the curve (6) corresponding to one convolution from one bottom portion (B) to an adjacent bottom portion (B') is symmetric about an axis perpendicular to the longitudinal axis (8) and through the global maximum within the top portion (T).

8. A device according to one or more claims 1-7, characterised in that the majority of the convolutions are substantially identical.

9. A device according to one or more of claims 1-8, characterised in that the device is made of an extruded metal alloy pipe and in that the convolutions are formed in a deep drawing process such as elastomeric forming or hydro forming.